REMARKS

The above listed claim amendments and the following remarks are believe fully responsive to the Office Action. By this Response claims 1, 14, 19, and 27 have been amended, claims 17, 23, and 34 have been cancelled, such that claims 1-16, 18-22, 24-33, and 35 are pending in the application.

Support for Claim Amendments

Support for the amendments to the claims can be found throughout the application, for example at paragraphs 10 (e.g., describing absorbing generated heat into a system panel and transferring the absorbed heat into liquid in a conduit), 24 (e.g., describing heat transfer), 34 (e.g., describing absorbing heat from combustion chamber), and 42 (e.g., describing insulating properties) of the application publication.

Rejections under 35 U.S.C. §§ 102, 103

As a starting point, it is acceded in the Office Action that Cleer does not disclose a material being condensation resistant (OA at p. 2); Cleer does not disclose a panel formed from a high temperature material using vacuum molding, compression molding or a casting process (OA at p. 3); Cleer does not disclose a panel formed from a material including ceramic fiber and binder (OA at p. 3); and Cleer does not disclose a panel integrally formed from a ceramic moldable material (OA at p. 3).

Claim 1 as amended relates, in part, to a hydronic heating system including a combustion chamber enclosure having a plurality of panels. A conduit is substantially embedded in at least one of the plurality of panels, the conduit being configured to carry a heat conductive liquid. The at least one panel has insulating properties such that the panel is configured to absorb heat from a heat source and transfer the absorbed heat to the liquid in the conduit while resisting formation of condensation on the panel. For at least the following reasons, claim 1 is patentable over the cited references.

The instant application describes that the "combustion chamber enclosure material includes insulating properties, or at least properties that promote a substantially linear temperature transition across the material thickness between the liquid in the conduits and the heated air of the combustion chamber so as to reduce the possibility of condensation forming in association with the heating appliance." Application Publication 2005/0199233 at paragraph 42. In general terms, one of ordinary skill would understand the instant application, including the portion quoted above, to include embodiments addressing panels having a relatively high thermal lag. For reference, materials with relatively high thermal mass (as determined by material heat capacity and thermal conductivity) have high thermal lags. Materials with high thermal lags have a slower response time, and are less susceptible to abrupt temperature variations. For example, when a relatively cooler liquid enters conduits embedded in a panel formed of a material having insulating properties, the panel is not cooled as quickly, and condensation does not form on the panel. As described in greater detail below, this is directly opposite to the more conductive, metal materials described in Cleer.

In particular, Cleer fails to teach, suggest, or otherwise provide a panel having insulating properties such that the panel is configured to absorb heat from a heat source and transfer the absorbed heat to liquid in a conduit while resisting formation of condensation on the panel in accordance with the limitations of claim 1 as amended. In fact, Cleer specifically teaches away from such limitations. Cleer repeatedly refers to the jacket 10 as being formed of metal. *E.g.*, Cleer at col. 2, ll. 6-11 ("the metal water jacket"); col. 3, ll. 3-5 ("spaced metal wall members"); col. 6, ll. 31-34 ("the welded-steel jacket 10 of the present invention"). Cleer also specifically states that "any suitable heat-conducting material is suitable for forming the structural components of the jacket 10" although "preferably all the walls of all the chambers will be formed of plate steel, the individual wall portions being welded together at the interfaces thereof" (emphasis added).

In view of Cleer's description, one of ordinary skill would appropriately read Cleer as forwarding the use of metal materials having relatively higher thermal conductivities and lower thermal lags, such as plate steel. This fails to provide and more likely teaches away

from a panel having insulating properties such that the panel is configured to absorb heat from a heat source and transfer the absorbed heat to a liquid in a conduit embedded in the panel while resisting formation of condensation on the panel. For at least such reasons, Cleer fails to teach, suggest, or otherwise provide the limitations of claim 1 as amended. Furthermore, and as described in greater detail below, one of skill in the art would not modify Cleer to provide the limitations of claim 1 in view of this teaching away from panels having insulating properties.

The Office Action forwards a modification of Cleer using ceramic fiber and binder materials described in Lyons. OA at p. 3. The reinforced ceramic fiber (RFC) materials of Lyons are specifically described as being "highly insulative." Lyons at col. 6, ll. 28-32. Although Lyons describes a fireplace box made of RFC material, that description is not associated with water jackets or other liquid heating applications. Thus, in view Cleer's use of relatively higher conductivity materials for water jacket 10, one having ordinary skill in the art would be led away from modifying the specific subject matter of Cleer with the materials of Lyons in the manner proffered in the Office Action.

Similarly, one would be led away from modifying Cleer with Wade and Susany. In particular, the understanding that Cleer forwards use of more conductive materials would lead away from using the ceramic material used to form the support base of Wade (a non-water jacket application), as well as teaching away from molding mineral wool fiber and refractory ceramic fiber (RFC) materials as described in Susany (a non-water jacket application).

The Office Action also cites Bussjager as providing a condensation resistant material for combination with Cleer. Rather than teaching a condensation resistant material, Bussjager describes a corrosion resistant material. *See* Bussjager at col. 3, ll. 48-55 ("evaporator 70 can be made of or coated with a corrosion-resistant material to withstand the effects of any condensate formed at outlet 48"). Thus, Bussjager seemingly takes the formation of condensation as a given, instead addressing corrosion rather than the formation of condensation itself. Clearly then, Bussjager does not teach, disclose, or otherwise provide a condensation resistant material, much less a panel material that has insulating properties

such that the panel is configured to absorb heat from a heat source and transfer the absorbed heat to the liquid in the conduit while resisting formation of condensation on the panel.

In view of at least the foregoing, claim 1, as well as claims 2-13 depending therefrom, are believed patentable over the cited references.

Independent claims 14, 19, and 27 are also believed patentable over the cited references for at least the following reasons. For example, claim 14 relates, in part, to a hydronic heating system for a fireplace including a liquid-filled conduit and a plurality of panels defining a combustion chamber. The panels are integrally formed from a ceramic moldable material using a molding process and are configured to resist formation of condensation on the panels. As described in association with claim 1 as amended, one of skill in the art would not modify Cleer with a ceramic moldable material or panels configured to resist formation of condensation as forwarded in the Office Action. For at least such reasons, claim 14 and claims 15, 16, and 18 depending therefrom are believed patentable over the cited references.

In turn, claim 19 as amended relates, in part, to a method of manufacturing a hydronic heating system that includes a panel and a liquid-filled conduit. The method includes forming a panel from a moldable material including a ceramic fiber and a binder, the panel being adapted to resist formation of condensation on an outer surface of the panel. A liquid-filled conduit is encapsulated in the panel such that the panel is adapted to absorb and conductively transfer heat to a liquid in the conduit. As described in association with claim 1 as amended, one of skill in the art would not modify Cleer with the cited references to provide a method including forming a panel from a moldable material including a ceramic fiber and a binder, much less a panel being adapted to resist formation of condensation on an outer surface of the panel. For at least such reasons, claim 19 and claims 20-22 and 24-26 depending therefrom are believed patentable over the cited references.

Claim 27 as amended relates, in part, to a heat exchanger including a molded panel including a ceramic fiber and a binder and a liquid-filled conduit embedded within the molded panel. As described in association with claim 1 as amended, one of skill in the art would not modify Cleer with the cited references to provide a molded panel including a

ceramic fiber and a binder. For at least such reasons, claim 27 and claims 28-33 and 35 are believed patentable over the cited references.

In sum, withdrawal of the rejections, allowance of claims 1-16, 18-22, 24-33, and 35, and notice to that effect are respectfully requested. The Examiner is invited to contact the undersigned at the number below to facilitate prosecution of this matter.

Respectfully Submitted,

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